MICHIGAN HAZARD MITIGATION COORDINATING COUNCIL

REPORT OF ACTIVITIES
2001

Pursuant to Executive Order 1998-5

Prepared by the
Emergency Management Division
Michigan Department of State Police
4000 Collins Road, PO Box 30636
Lansing, Michigan 48909-8136
http://www.mspemd.org

in conjunction with the

Michigan Hazard Mitigation Coordinating Council
Special Projects and Public Education Committees

May 10, 2002

MICHIGAN HAZARD MITIGATION COORDINATING COUNCIL

Partnering for a Safer Tomorrow

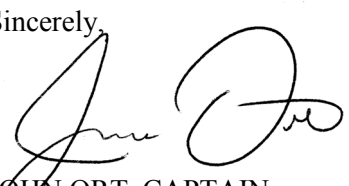
As Chairperson of the Michigan Hazard Mitigation Coordinating Council, I am proud to present this Report of Activities for 2001.

Since its creation by Executive Order 1998-5 on July 29, 1998, the Council has been instrumental in formulating and charting the future direction and focus of Michigan's hazard mitigation efforts aimed at reducing or eliminating the long-term risk to human life and property from natural, technological, and human-related hazards within the state. In 2001, the full Council met five times and its operating committees met a total of 26 times. At these meetings, many important and timely issues were examined and many actions were proposed to help Michigan's citizens and communities better cope with the hazards they face.

Thankfully, 2001 was a relatively uneventful year for Michigan in terms of major disasters or emergencies. However, the terrorist attacks that occurred on September 11 and the anthrax contamination incidents that occurred in October served as reminders that we are vulnerable to a wide array of disasters that often are beyond our control. However, we must take proactive steps, whenever possible, to reduce or eliminate the long-term risk and potential negative impacts of all disasters on Michigan's citizens and communities. To that end, the Council intends to increase its efforts in 2002 in mitigation marketing and public education, mitigation planning, and public-private partnership building. The Council's 2002 agenda also includes several initiatives designed to reduce the state's vulnerability to flooding – one of our most problematic and costly hazards.

The Council looks forward to the many challenges and opportunities that lie ahead in 2002 and beyond. Working in partnership with other governmental agencies and the private sector, the Council's ultimate goal is to make every Michigan community as disaster resistant as possible through proactive action and an informed citizenry.

Sincerely,



JOHN ORT, CAPTAIN
Chairperson
Michigan Hazard Mitigation Coordinating Council

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INTRODUCTION AND BACKGROUND

What is Hazard Mitigation?

Hazard mitigation is defined as any action taken before, during, or after a disaster or emergency to permanently eliminate or reduce the long-term risk to human life and property from natural and technological hazards. It is an essential element of emergency management, along with preparedness, response and recovery. When successful, mitigation will lessen the need for a community to respond to succeeding hazard events; that is, incidents will remain incidents and not become disasters.

State Government Role

Hazard mitigation strives to reduce the impact of hazards on people and property through the coordination of resources, programs, initiatives and authorities. State government has a vital coordinating role to play in this effort. Laws and processes governing the use of land and development of property originate at the state level. In addition, state agencies administer a wide variety of programs that affect – either directly or indirectly – the development and use of land. For these reasons, state government is the logical origination point for mitigation measures that have statewide application and/or implications.

Local Government Role

However, the implementation of hazard mitigation measures is inherently a local government function since that is the level at which development occurs, and most of the land use / development tools available to implement mitigation measures are applied at the local level. Therefore, successful implementation of a program to reduce Michigan's vulnerability to hazards will, out of necessity, be a joint cooperative effort between the State, local governments, and the private sector (since most land development is undertaken by private entities).

Coordination of Ongoing Efforts

Coordination is probably the most critical factor in a successful mitigation effort or program. Many state and local agencies (as well as some private sector organizations) are already performing functions or administering programs that in some way contribute to mitigating hazards. However, coordination of these programs and activities to achieve widespread hazard risk and vulnerability reduction is often limited, if it occurs at all.

Michigan Hazard Mitigation Coordinating Council

In response to that problem, Governor John Engler signed Executive Order 1998-5 on July 29, 1998, creating the Michigan Hazard Mitigation Coordinating Council (MHMCC). The Council is chaired by the Emergency Management Division of the Michigan Department of State Police (EMD/MSP) and is composed of 10 members – seven from Michigan state agencies, two from private industry, and one from local emergency management. Executive Order 1998-5 charged the Council with four primary responsibilities:

- Assist in the development, maintenance, and implementation of a state hazard mitigation plan;
- Assist in the development, maintenance, and implementation of guidance and informational materials to support hazard mitigation efforts of local and state government, and private entities;
- Solicit, review, and identify hazard mitigation projects for funding under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 93-288, as amended, and Sections 553 and 554 of the National Flood Insurance Reform Act, PL 103-325; and
- Foster and promote, where appropriate, hazard mitigation principles and practices within local and state government, and with the general public.

The Council is divided into five operating committees, as follows: Finance; Legislative; Planning; Public Education; and Special Projects. The Council meets six times per year on a bi-monthly basis. The individual committees meet as needed between the formal Council meetings.

Vision and Mission Statements

In 1999, the Council formally adopted the following Vision and Mission Statements:

Vision Statement

"Michigan will be a state where hazard vulnerability reduction is a standard practice in both government and the private sector."

Mission Statement

"To foster, promote and implement measures to eliminate or reduce the long-term risk to human life and property from the effects of natural and technological hazards in accordance with Executive Order No. 1998-5."

Michigan Hazard Mitigation Plan Statewide Mitigation Goals

In 1999, the Council formally adopted the following goals for the Michigan Hazard Mitigation Plan (MHMP) and for statewide hazard mitigation activities:

Goal 1

Promote Life Safety: Minimize disaster-related injuries and loss of life through public education, hazard analysis, and early warning.

Goal 2

Reduce Property Damage: Incorporate hazard mitigation considerations into land use planning / management, land development processes, and disaster resistant structures.

Goal 3

Build Alliances: Forge partnerships with other public safety agencies and organizations to enhance and improve the safety and well being of all Michigan communities.

Goal 4

Provide Leadership: Provide leadership, direction, coordination, guidance, and advocacy for hazard mitigation in Michigan.

February 21, 2001 MHMCC Meeting

Michigan Hazard Mitigation Coordinating Council Members And Support Staff

Representing Col. Michael Robinson:

Capt. Edward Buikema*, Chair (through October 2001)
Michigan Department of State Police, Emergency Management Division
(*Capt. Buikema retired from the Michigan State Police in October 2001and was replaced by **Capt. John Ort**. Capt. Ort served as Chair of the December 19, 2001 meeting.)

Representing Mr. Russell J. Harding:

Mr. George Hosek
Michigan Department of Environmental Quality, Land and Water Management Division

Representing Mr. K.L. Cool:

Mr. Edward Hagan
Michigan Department of Natural Resources, Forest Management Division

Representing Mr. Dan Wyant:

Mr. P. David Charney
Michigan Department of Agriculture, Marketing and Communications Division

Representing Ms. Kathy Wilbur:

Mr. Craig Newell
Michigan Department of Consumer and Industry Services, Director's Office

Representing Mr. Greg Rosine:

Ms. Eileen Phifer
Michigan Department of Transportation, Maintenance Division

Representing Mr. Duane Berger:

Mr. Okey Eneli
Michigan Department of Management and Budget, Office of Design and Construction

Representing the Property & Casualty Insurance Industry:

Mr. Kurt Gallinger
Dykema Gossett PLLC

Representing an Urban Planning Association:

Dr. William D. Wagoner
Livingston County Emergency Management

Representing a Local Emergency Management Program:

Mr. Rodney Krieger
D.C. Cook Nuclear Power Plant

Michigan Department of State Police / Emergency Management Division (EMD/MSP) Mitigation Unit Staff:

Bethany Hall, Mitigation and Recovery Section Manager
Doran Duckworth, Mitigation Unit Supervisor
Dawn Schulert, State Hazard Mitigation Officer
Matt Schnepp, Assistant State Hazard Mitigation Officer
Karen Totzke, MHMCC / Project Impact Coordinator
Mike Sobocinski, Local Hazard Mitigation Planner
Angela Houseman, Secretary

Eric Nischan, Geographic Information System (GIS) Coordinator, (EMD/MSP Preparedness Section)

Michigan Hazard Mitigation Coordinating Council
Front Row, L-R: Dr. William Wagoner; Craig Newell; Rodney Krieger; Eileen Phifer.
Back Row, L-R: Capt. Edward Buikema; George Hosek; Duane Berger; Edward Hagan; David Charney
Not Pictured: Capt. John Ort (appointed 10/01); Okey Eneli (appointed 4/01); Kurt Gallinger

2001 ACTIVITIES AND ACCOMPLISHMENTS

In 2001, the Council began to prioritize its efforts in guiding and shaping the nature, scope, and magnitude of Michigan's hazard mitigation efforts:

February 21, 2001 Meeting

The February 21 meeting focused on the review, prioritization, selection and approval of mitigation projects to be submitted to the Federal Emergency Management Agency (FEMA) for funding consideration under the Hazard Mitigation Grant Program (HMGP) for Federal Disaster 1346. The Council reviewed the Special Project Committee's recommendations on nearly 170 projects submitted by local governments and state agencies – everything from enhancing early warning systems to acquiring and relocating floodprone homes. After a lengthy review, the Council approved the selections made by the Special Projects Committee and directed the EMD/MSP Mitigation Unit staff to process the applications and submit them to FEMA for funding consideration. (Note: this was the initial round of HMGP project selections for Federal Disaster 1346. A second round was held later that spring. See the June 20, 2001 meeting summary below.)

Statewide Early Warning System Study

The Council concurred with a Special Projects Committee recommendation for a comprehensive statewide early warning system study to help determine existing early warning capability in Michigan and what types of warning systems should be funded in the future under the HMGP. The EMD/MSP Mitigation Unit agreed to begin work on the study using a combination of internal and external resources. The study will be completed in phases over a period of several years. FEMA Region V assigned a Disaster Assistance Employee (DAE) from its staff to assist in conducting some of the background research on the range of available warning system technology and the appropriate application of each system.

New Early Warning Siren in City of Hamtramck Will Help Save Lives!
(one of 76 early warning siren projects funded in Michigan in recent years using HMGP funds)

Mitigation Achievement Award
At the behest of the EMD/MSP Mitigation Unit, the Public Education and Special Projects Committees agreed to work together on creating an award to formally recognize individuals or communities that do something outstanding in mitigation. The mitigation achievement award would be a way of recognizing outstanding individuals, communities and efforts, but it would only be given when merited, not annually. The two committees are working on the type of award to be given as well as establishing award criteria and eligibility requirements. This project should be completed in early 2002.

April 18, 2001 Meeting

The April 18 meeting again focused on project selections for funding consideration under the HMGP for Federal Disaster 1346. It was determined that a second round of projects would be funded and the Special Projects Committee would need to schedule several meetings in late April and May to review, prioritize and recommend projects for the full Council's approval. In other business, the Planning Committee discussed two recent outreach meetings that it held with the insurance industry to identify areas of common interest and to solicit support for hazard mitigation activities. Both meetings were very productive and will lead to increased cooperation and coordination in the future. The Public Education Committee finalized plans to have an information booth at the May 2001 statewide emergency management conference in Novi, and at similar conferences to be held later in the year.

Policies on National Flood Insurance Program Participation and Dam Removal
The Council approved two policies aimed at clarifying its positions on National Flood Insurance Program (NFIP) participation and funding projects to remove dams. The Special Projects Committee recommended that the Council not fund HMGP projects in a community that does not participate in the NFIP. After considerable debate, the Council approved a policy that requires communities to submit a compliant application package to join the NFIP prior to final obligation of HMGP funds for flood projects. (The policy does not affect projects designed to mitigate wind, fire or other non-flood hazards.) The Council felt this policy was needed to

strengthen floodplain management in Michigan and to show the importance of participating in the NFIP as a basic flood mitigation measure.

The Special Projects Committee also recommended that the Council adopt a formal policy on funding of dam safety and mitigation projects. Because of the importance of life safety and property damage reduction, the Committee felt that both significant and high hazard dams should be considered when selecting projects for dam safety modifications and dam removals. The Council approved a policy that establishes a project prioritization framework that ranks high hazard dam removal as the top priority, followed in order by high hazard dam safety modifications and significant hazard dam removal.

June 20, 2001 Meeting

The June 20 meeting focused on two primary topics: HMGP project approvals and Project Impact. Ms. Natalie Kissel, Ottawa County Project Impact Coordinator, provided an overview of Ottawa County's Project Impact activities and then received a Resolution of Appreciation from the Council for her fine work in Project Impact during her two-year tenure (see below). Cheri Standfest, City of Midland Project Impact Coordinator, and Pete Locke, City of Dearborn Project Impact Coordinator, also gave presentations on the Project Impact activities going on in their respective communities. The focus of Midland's Project Impact efforts is stormwater drainage improvements and flood damage reduction through a drain inspection and cleaning program. Dearborn's Project Impact efforts have focused on improving public education about hazards, hazard mitigation and general disaster preparedness. Dearborn also installed an emergency generator in the City's community center – their primary shelter for disasters and emergencies.

Mitigation Education Program for Michigan Drain Commissioners

Lt. Don Woodward, EMD/MSP District Coordinator for the western part of Michigan, provided the Council with an overview of a mitigation public education effort aimed at Michigan's Drain Commissioners. The EMD/MSP, in conjunction with the Michigan Departments of Agriculture, Environmental Quality and Transportation, has conducted a series of informational seminars for Drain Commissioners across the state to educate them on various techniques that can be employed to mitigate damage to the drainage infrastructure as well as the available programs for funding such measures. This educational program will be continued in future years as need and resources allow.

Reshaped and armored drain in Sherman Township, Iosco County
(good example of mitigating potential damage to drainage infrastructure)

Hazard Mitigation Grant Program Project Selections for Federal Disaster 1346

The Special Projects Committee completed its selection of projects for funding consideration under the Hazard Mitigation Grant Program for Federal Disaster 1346. The Special Projects Committee met a total of nine (9) times from January to May of 2001 to review and prioritize 423 project proposals submitted to the EMD/MSP Mitigation Unit. From those 423 project proposals, the Council approved 135 projects to submit to FEMA for HMGP funding consideration. The selected projects totaled nearly $45 million in project costs - $33.2 million in federal share and the remainder in local share. (The Council approved the 135 projects in two selection rounds. See the February 21, 2001 meeting summary above for additional information on the first selection round.)

Resolution of Appreciation for Ottawa County Project Impact Coordinator

Ms. Natalie Kissel, Ottawa County's Project Impact Coordinator, was awarded a Resolution of Appreciation from Council Chair Edward Buikema for her dedication in making Ottawa County a more disaster resistant county. Ms. Kissel increased the awareness and coordination with the cities, townships, villages and private industry within Ottawa County in mitigating the negative impacts caused by natural and technological disasters. Under her guidance, a detailed Hazards Analysis and Hazard Mitigation Plan was developed for Ottawa County. In addition, the County established a dry fire hydrant development program, upgraded early warning sirens in several areas, revised Flood Insurance Rate Maps, established local floodplain management ordinances, developed a relief drain project, and developed Emergency Action Plans for several dams. Ms. Kissel's efforts under Project Impact have undoubtedly helped make Ottawa County a more disaster resistant and livable community.

Resolution of Appreciation for Ms. Natalie Kissel,
Ottawa County Project Impact Coordinator

(Pictured L-R: Lt. Don Woodward, EMD/MSP 6th District Coordinator; Natalie Kissel, Ottawa County Project Impact Coordinator; Capt. Edward Buikema, MHMCC Chair; William Smith, Ottawa County Emergency Management Coordinator)

Ottawa County's Dry Fire Hydrant Development
Program was a Successful Project Impact Initiative

Project Impact Signing Ceremony at Dearborn City Hall
April 23, 2001
(Pictured L-R: U. S. Rep. John Dingell, 16th District of Michigan; Dearborn Mayor Michael Guido; Norbert Schwartz, FEMA Region V; Capt. Edward Buikema, EMD/MSP Commander and MHMCC Chair; Peter Locke, Dearborn Project Impact Coordinator)

Certificates of Appreciation for HMGP Selection Panel Members
The Council awarded Certificates of Appreciation to four individuals on the HMGP State Selection Panel (a subgroup of the Special Projects Committee that provides technical advice and assistance in reviewing HMGP project proposals) for their dedication and tireless efforts during the HMGP project selection process for Federal Disaster 1346. Those individuals are: Bruce Menerey and George Hosek of the Michigan Department of Environmental Quality; Eileen Phifer of the Michigan Department of Transportation; and Jeff Friedle of the Michigan Department of Agriculture.

Certificates of Appreciation for HMGP State Selection Panel Members for Federal Disaster 1346
(Pictured L-R: George Hosek, Eileen Phifer, Bruce Menerey and Jeff Friedle receive their Certificates of Appreciation from Capt. Edward Buikema, MHMCC Chair, at the June 20, 2001 meeting)

Outreach to Urban / Regional Planning Profession
The Planning Committee is working on an outreach program with the urban / regional planning programs at Michigan State University, the University of Michigan, Eastern Michigan University, and Wayne State University to integrate hazard mitigation into the planning curriculum at each school. Mike Sobocinski, the EMD/MSP Local Mitigation Planner, and Dr. William Wagoner, Committee Chair, each made presentations at the schools on hazard mitigation. In addition, Wayne State University has agreed to conduct two courses on hazard mitigation in the spring of 2002 (both to be taught by Dr. Wagoner) and to consider establishing a certification program for hazard mitigation. In the future, the Planning Committee would also like to work with the American Institute of Certified Planners (AICP) – an arm of the American Planning Association (APA) – to incorporate hazard mitigation courses into their certification program for urban / regional planners nationwide. These actions emphasize the importance of the urban / regional planning profession in furthering the cause of hazard mitigation in Michigan and across the country. Such outreach efforts are designed to "institutionalize"

hazard mitigation concepts and principles in the planning profession by going directly to the source of future planning professionals – the urban / regional planning programs at colleges and universities.

August 15, 2001 Meeting

The August 15, 2001 meeting opened up with a presentation on the Michigan Fire Prevention Act (207 P.A. 1941) by Tom Endelmann of the Michigan Department of Consumer and Industry Services Office of Fire Safety. Mr. Endelmann described the basic provisions of the law as well as the steps his agency takes to implement and enforce those provisions. Mr. Endelmann also described some possible ways in which his agency could work more closely with the Council on structural fire mitigation measures. The Council agreed to coordinate closely with the Office of Fire Safety in the future on structural fire mitigation issues.

Michigan's 2001 Project Impact Community Approved

The Council approved Ingham County as Michigan's 2001 Project Impact Community. Ingham County's application for Project Impact Community status was very impressive and listed a number of potential mitigation projects that could be implemented to make the county more disaster resistant. Karen Totzke, the EMD/MSP's Project Impact Coordinator, will work with the county in the coming months to develop and implement those mitigation projects and to develop and nurture public-private partnerships to assist in Project Impact activities. Ingham County will receive a $300,000 grant from FEMA to provide seed money for the Project Impact effort.

Michigan "Safety House" and "Safety First Community" Concept Papers

Doran Duckworth, the EMD/MSP Mitigation Unit Supervisor, presented concept papers on two subjects – a Michigan "Safety House" and a Michigan "Safety First Community" Program. These papers were developed by Mr. Duckworth under a cooperative agreement with FEMA and are intended to provide the necessary background information and research to facilitate further development and implementation of the two projects.

MICHIGAN "SAFETY HOUSE"

CONCEPT PAPER
July 2001 (Initial Draft)

Developed pursuant to the
Michigan Hazard Mitigation Plan

The Michigan "Safety House" concept paper describes the need for a demonstration model that would showcase and promote home safety measures and disaster resistant building practices, materials and techniques through actual construction details, displays, cut away walls and ceilings, and other display methods. The model would focus on fire safety, floodproofing, wind bracing, freeze protection, hail resistance, utilities protection, home invasion prevention, and similar hazards typically faced by Michigan homeowners. The concept paper describes several options for such a project:

- A tabletop modular model (similar to an architect's model in size and level of detail)
- A trailer size portable model or permanent model (approximate in size to a large home storage shed)
- A full size permanent model (approximate in size to a large two car garage or small ranch home)
- A replica "townscape" with multiple disaster resistant buildings (either full size buildings or miniaturized replicas)

A Michigan Safety House would provide a focal point for the promotion of and education about home safety measures and disaster resistant construction techniques, practices and materials. It would also provide a three

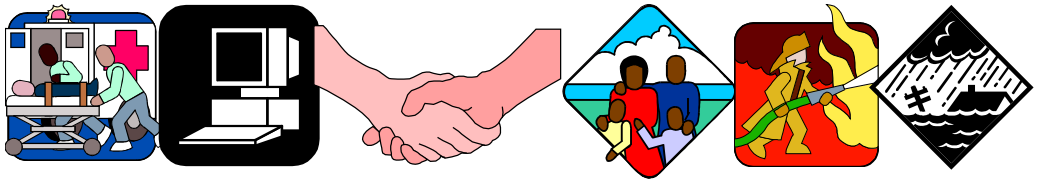
dimensional "living laboratory" that would showcase the proper application of home safety measures and disaster resistant construction. Such a structure would inspire homeowners and builders / developers to "raise the bar" on home construction in Michigan so that proven home safety and disaster resistant construction measures become the norm in new homes and major home renovations in Michigan.

The Michigan "Safety First Community" concept paper describes the need for establishing a comprehensive public safety enhancement and recognition program in Michigan aimed at fostering and promoting a more coordinated, holistic view of public safety activities in Michigan communities. The concept paper provides a suggested "roadmap" for establishing such a program and for institutionalizing it within the public safety framework in Michigan. The Safety First Community concept is, in many ways, an expansion of FEMA's Project Impact model and philosophy of building more disaster resistant communities through public-private partnerships. A Safety First Community would be a community that establishes and follows the comprehensive public safety enhancement program in the concept paper designed to improve community public safety knowledge and practices, coordination of services, and cooperation and participation among all public safety service providing agencies. The Safety First Community program would provide an incentive for communities to enhance the scope of their public safety services and the quality of service delivery. The program would formally recognize those communities that do an exemplary job of promoting and participating in public safety enhancement and coordination programs. In addition, it would provide greater visibility to and awareness of the interrelationship of public safety services.

MICHIGAN "SAFETY FIRST COMMUNITY" RECOGNITION PROGRAM

CONCEPT PAPER
March 2001 (Initial Draft)

Developed pursuant to the
Michigan Hazard Mitigation Plan



The Council will study these two concept papers for possible implementation in 2002-2003.

<u>October 17, 2001 Meeting</u>

The Council's October 17, 2001 meeting was cancelled due to the rash of suspected anthrax contamination incidents that occurred after the September 11, 2001 terrorist attacks on the United States. The EMD/MSP Mitigation Unit staff was heavily involved in the State's response to those incidents and spent a considerable amount of time in the State Emergency Operations Center during late September and October collecting and compiling incident reports.

<u>December 19, 2001 Meeting</u>

The December 19, 2001 meeting was the first for new Council Chair, Captain John Ort, Commander of the EMD/MSP. (Captain Ort assumed the Chair in October 2001 upon the retirement of Captain Edward Buikema, who accepted the position of Director of the FEMA Region V Office in Chicago, Illinois.) The Council addressed a wide variety of issues at this meeting, most notable of which included:

Executive Directive 2001-5: State Flood Hazard Mitigation

On September 11, 2001, Governor Engler signed Executive Directive 2001-5 (State Flood Hazard Mitigation) which directs the Michigan Department of Environmental Quality to work with the Council and other state agencies to develop a statewide, interagency flood mitigation strategy to assure compliance with the State Flood

Hazard Mitigation Plan (as outlined in Executive Order 1977-4 issued by former Governor William Milliken). The new Executive Directive was the culmination of a year's worth of effort by the Legislative and Special Projects Committees in working with the Governor's legal staff. The Directive is an important accomplishment for the Council because it emphasizes the importance of good floodplain management and will re-focus state agency efforts in that area over the coming years.

(An electronic copy of Executive Directive can be found on page 20.)

Statewide Mitigation Marketing / Public Education Campaign

Through much of 2001, the Public Education Committee worked closely with the EMD/MSP Mitigation Unit staff in developing a strategy for a statewide mitigation marketing campaign to educate the public about Michigan's hazards and available mitigation measures to reduce vulnerabilities to those hazards. The culmination of that preliminary groundwork was the approval by FEMA of a $50,000 project grant to develop and implement the marketing campaign during the period 2002-2004. The specifics of the campaign have yet to be determined, but it will likely focus on the development of public-private partnerships to educate Michigan's citizens and develop awareness projects at the local level – similar to FEMA's Project Impact model and philosophy.

MHMCC Display Board is One Aspect of the Public Education Committee's Marketing and Outreach Efforts

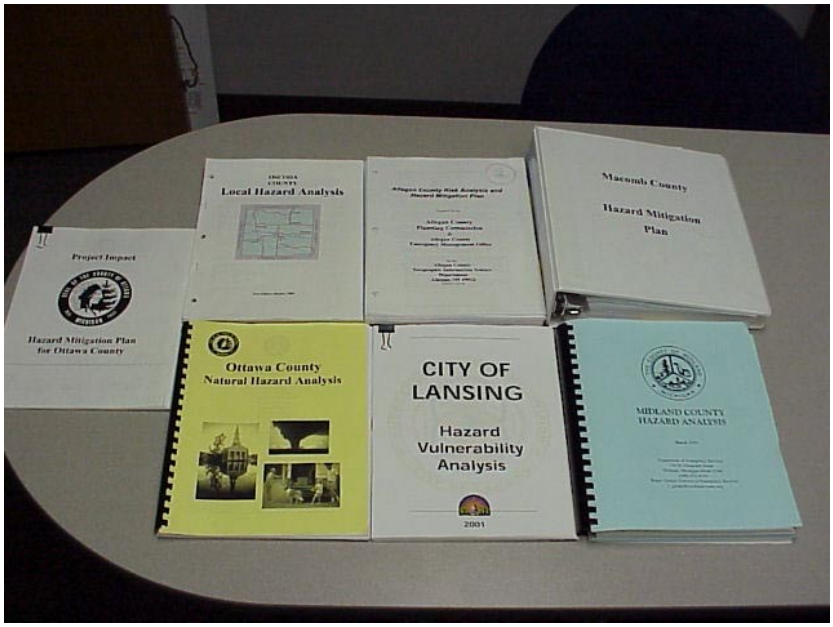
Statewide Mitigation Planning Project

The EMD/MSP Mitigation Unit has been actively promoting the development of local hazard mitigation plans for the past several years, although both staff and monetary resources have been in short supply to support that effort. However, the planning effort got a major boost in November 2001 when FEMA authorized states to use up to 7% of their available HMGP allocation for the development of state, local or tribal government hazard mitigation plans. This new provision under the Disaster Mitigation Act of 2000 will allow Michigan to devote up to 7% ($2.3 million) of the available HMGP funds under Federal Disaster 1346 ($33.2 million in federal funds) to support mitigation plan development. The EMD/MSP Mitigation Unit would like to use the $2.3 million in available funds to initiate a statewide hazard mitigation planning program over the next three years (2002-2004). The goal of that program is to develop multi-hazard mitigation plans in all emergency management program jurisdictions in Michigan (all counties and most major municipalities) by the end of 2004. This is not only good emergency management practice and public policy, but more importantly it will help ensure that local jurisdictions and the State are eligible for and can utilize HMGP funds in future federally-declared disasters. (Under the Disaster Mitigation Act of 2000, all applicants for HMGP funds must have an approved mitigation plan in place prior to being allocated funds. The statewide planning initiative will help

ensure that those plans are developed and approved prior to Michigan's next major disaster, thereby allowing the State to utilize the greatest amount of federal grant support for mitigation measures.)

Although the specifics of the planning initiative have not yet been finalized, it can probably best be accomplished by coordinating with current planning offices at the regional and/or local level. In areas where comprehensive planning activities are currently active, hazard mitigation planning can be integrated with those activities. In areas without active planning efforts, regional planning offices may be asked to perform such planning within their jurisdictional areas. Any areas unable to partner with existing planning activities may receive direct assistance from EMD/MSP Mitigation Unit staff.

The Council approved the statewide mitigation planning approach and directed the EMD/MSP Mitigation Unit staff to begin implementation as soon as possible.



Local Emergency Management Program Jurisdictions will be Developing a Hazard Analysis and Hazard Mitigation Plan

Statewide Repetitive Flood Loss Properties Project

Reducing claims of repetitive flood loss properties under the National Flood Insurance Program (NFIP) is a major goal of both FEMA and the State of Michigan. In 2001, there were 456 properties on FEMA's list of repetitive flood loss properties in Michigan – properties on which there were two or more claims under the NFIP in a 10-year period. To help reduce the number of properties on that list, the EMD/MSP Mitigation Unit proposed allocating up to $4 million in available HMGP funds under Federal Disaster 1346 to elevate or acquire and remove as many of the structures as possible from those 456 properties. Elevating or acquiring/removing the structures will provide a permanent solution to the flooding concerns associated with the properties. The Council approved the repetitive flood loss properties project as proposed and directed the EMD/MSP Mitigation Unit staff to begin implementation as soon as possible.

Because of the magnitude of the proposed project, there are several significant obstacles that will have to be addressed. Because the program will be strictly voluntary, the first task is to determine how many of the 456 property owners are interested in participating. After that is determined, each participating property will have to undergo a detailed cost/benefit analysis to determine if the project is feasible, as well as an environmental review to determine and document any anticipated impacts to natural, historical or archeological resources in the immediate area. The EMD/MSP Mitigation Unit does not have sufficient staff to contact potential participants and carry out these detailed studies for the individual properties. Therefore, a project management contractor will be hired to handle those aspects of the project and the EMD/MSP Mitigation Unit will provide overall project oversight. The project should be completed by the end of 2004.

(Note: although many states elevate and acquire/remove homes from floodplains using HMGP funds, no other state in FEMA Region V has attempted to undertake a project of this type and magnitude, i.e., "tackling" their NFIP repetitive loss properties list at one time. Therefore, Michigan will be breaking new ground. If the project is successful, it will provide a good model for other states to follow in addressing their own NFIP repetitive loss properties list using HMGP and other available funds.)

The Statewide Repetitive Flood Loss Properties Project Should Make Scenes Like This Less Common

Michigan Hazard Mitigation Plan Revision
During 2001, the MHMCC operating committees thoroughly reviewed and re-prioritized their assigned objectives in the Michigan Hazard Mitigation Plan (MHMP). Currently, the plan has 67 specific objectives listed under four primary goals. Some of those objectives have been accomplished over the past two to three years through the proactive efforts of the Council, state and local agencies, and the EMD/MSP. In 2002, the EMD/MSP Mitigation Unit and Council will make the necessary revisions to the MHMP to reflect the Council's re-prioritization of assigned objectives and recent accomplishments. The revised plan will also be given a "facelift" in terms of format and graphics and will be posted on the Council's web page within the EMD/MSP web site (www.mspemd.org).

City of Midland Project Impact Closeout
In December 2001, the City of Midland – Michigan's first Project Impact Community – closed out its three-year Project Impact grant with FEMA after making significant progress in becoming a more disaster resistant city. Major accomplishments included the development of a detailed hazards analysis and hazard mitigation plan, improved public education and awareness of community hazards, and implementation of a major flood reduction project that involved inspecting and cleaning of six miles of drains within the city limits. More importantly, the city developed many public-private partnerships that will continue on long after the initial Project Impact effort, ensuring that Midland will remain a disaster resistant community well into the future.

(Note: Karen Totzke, the EMD/MSP Project Impact Coordinator, spent a considerable amount of time and effort in working with the city of Midland to make Project Impact a success. The Council appreciates Ms. Totzke's work in Midland and in Michigan's other Project Impact Communities.)

Section of Recently Completed Floodwall at Bay City Wastewater Treatment Plant
(will reduce repetitive flood damage to this critical public facility)

Modified Tuscola County Drainage Culvert – Coleman Drainage District
(will reduce repetitive flood damage caused by inadequate
hydrologic / hydraulic capacity and flow)

Rerouted Storm Sewer and Modified Outlet
City of Harbor Beach, Huron County

Reconstructed Flint River Dike (prior to reseeding)
Taymouth Township, Saginaw County

One of Eight Concrete Tornado "Safe Rooms" Being Constructed
With HMGP Funds at Michigan State University Day Care Facility
(will help protect children and staff during tornadoes and other severe weather events)

2002 AND BEYOND: FUTURE DIRECTIONS

In 2002, the Council will be involved in a variety of hazard mitigation activities related to project identification and development, mitigation planning, public education, legislation, and mitigation financing:

2002 Meeting Schedule

In 2002, the Council will hold its regular meetings at 1:30 PM on the following dates:

- February 20, 2002
- April 17, 2002
- June 19, 2002
- August 21, 2002
- October 16, 2002
- December 18, 2002

Council meetings are held in the Terrace Room at the EMD/MSP offices, 4000 Collins Road in Lansing.

Project Identification and Development

The Council allocated all available HMGP funds under Federal Disaster 1346 in 2001 and will continue to work with the EMD/MSP Mitigation Unit staff in monitoring the grants and implementing projects. If Michigan receives a Presidential Disaster Declaration in 2002 that includes activation of the Hazard Mitigation Grant Program, the Council will be convened to assist in developing a mitigation strategy for the disaster, and for developing, reviewing, prioritizing and selecting projects to be submitted to FEMA for HMGP funding consideration.

The Council will also assist in allocating planning, technical assistance and project grant funding under the Flood Mitigation Assistance Program (FMAP) in 2002. Grants under the FMAP are used to reduce the risk of flood damage to structures insurable under the National Flood Insurance Program.

Mitigation Planning

The Planning Committee will assist EMD/MSP Mitigation Unit staff in revising the Michigan Hazard Mitigation Plan to reflect the Council's re-prioritization of assigned objectives. The revised plan will be submitted to FEMA Region V for review and certification. In addition, the Council will assist in updating the State Administrative Plans for the Hazard Mitigation Grant Program and Flood Mitigation Assistance Program. These revised plans will also be submitted to FEMA Region V for annual review and certification.

The Council will also oversee the statewide mitigation planning initiative that will be developed and implemented in 2002 by the EMD/MSP Mitigation Unit staff. That project will help ensure that Michigan is prepared and able to accept and use Hazard Mitigation Grant Program funds in future federally-declared disasters. It will also help local jurisdictions in assessing their risk and vulnerabilities to a wide range of natural, technological and human-related hazards, and in identifying and prioritizing their mitigation needs.

Marketing and Public Education

The Public Education Committee's primary focus in 2002 and beyond will be the statewide hazard mitigation marketing campaign being implemented under a $50,000 HMGP grant. The Committee will finalize the development of a strategy for the campaign and assist the EMD/MSP in implementing specific aspects of the campaign. The Committee will also continue to work on developing new presentations and display boards about the Council and its activities for conferences, meetings and other functions. The Committee did several presentations in 2001 and likely will do more in 2002. Enhancing the Council's web page on the EMD/MSP web site will be another 2002 activity. A number of improvements and enhancements have been suggested related to content, format, appearance and functionality. The Committee is working with the EMD/MSP to implement desired changes as part of an overall EMD/MSP web page revision.

Legislation

Now that Executive Directive 2001-5 has been completed, the Legislative and Special Projects Committees will continue to work on the development of the statewide, interagency flood mitigation strategy specified in the Directive. That strategy is important because it is a basic requirement of the National Flood Insurance Program. The intent of the strategy is to prohibit state agencies from funding development that does not comply with NFIP standards and provisions.

The Legislative Committee will also continue to work with the State Agency Legislative Liaisons to identify and comment on legislation that may affect or influence state and local mitigation activities or increase the State's long term risk and vulnerability to hazards.

Mitigation Financing

The Finance Committee is looking at ways to develop and strengthen partnerships with governmental agencies and private industry in promoting and financing hazard mitigation measures. A variety of possibilities are being explored.

2002 looks to be an exciting and groundbreaking time for the Michigan Hazard Mitigation Coordinating Council as no less than three major statewide projects will be implemented during the year in the areas of planning, public education and marketing, and flood loss reduction. These projects will undoubtedly be the focus of the Council's efforts in 2002 as well as the next several years. The Council is, in many ways, charting untested waters in terms of scope and magnitude of these projects. However, the potential payoffs are great if the projects can be successfully developed, managed and implemented.

EXECUTIVE ORDER No. 1998 – 5 (ELECTRONIC COPY)

MICHIGAN HAZARD MITIGATION COORDINATING COUNCIL

WHEREAS, hazard mitigation is defined as any action taken before, during, or after a disaster or emergency to permanently eliminate or reduce the long-term risk to human life and property from natural and technological hazards; and

WHEREAS, the State of Michigan recognizes the importance of preventing or lessening the damage and impact of disasters and emergencies through hazard mitigation; and

WHEREAS, state government has a unique role to play in coordinating the hazard mitigation activities of state and local governments; and

WHEREAS, increased coordination can assist in lowering future disaster relief expenditures and increasing the level of public safety for all Michigan communities; and

WHEREAS, it is appropriate that state government bring together technical experts from state and local government and private industry to foster and promote the implementation of hazard mitigation measures.

NOW, THEREFORE, I, John Engler, Governor of the State of Michigan, pursuant to the powers vested in me by the Constitution of the State of Michigan of 1963 and the laws of the State of Michigan, do hereby establish the Michigan Hazard Mitigation Coordinating Council.

1. The council shall be composed of the following members:

a. The Director of the Department of State Police, or his designee, who shall serve as chair;

b. The Director of the Department of Environmental Quality, or his designee;

c. The Director of the Department of Natural Resources, or his designee;

d. The Director of the Department of Agriculture, or his designee;

e. The Director of the Department of Consumer and Industry Services, or her designee;

f. The Director of the Department of Transportation, or his designee;

g. The Director of the Department of Management and Budget, or her designee;

h. One representative of the property and casualty insurance industry, who shall be appointed by the Governor and serve a 3-year term;

i. One representative of an urban planning association, who shall be appointed by the Governor and serve a 3-year term;

j. One representative of a local emergency management program, who shall be appointed by the Governor and serve a 3-year term.

2. The council shall perform the following responsibilities:

a. Assist in the development, maintenance, and implementation of a state hazard mitigation plan;

b. Assist in the development, maintenance, and implementation of guidance and informational materials to support hazard mitigation efforts of local and state government, and private entities;

c. Solicit, review and identify hazard mitigation projects for funding under section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, P.L. 93-288, as amended, and sections 553 and 554 of the National Flood Insurance Reform Act, P.L. 103-325;

d. Foster and promote, where appropriate, hazard mitigation principles and practices within local and state government, and with the general public.

3. The Department of State Police shall perform all administrative functions associated with the operation of the council, provide technical guidance for hazard mitigation planning and plan implementation, and act as liaison to the Federal Emergency Management Agency for project funding and program coordination.

4. The council may seek the expertise of other individuals, agencies, and organizations as it deems necessary to carry out its responsibilities.

5. The council may solicit, accept, and expend, subject to necessary legislative appropriations, funding received from the federal government and private individuals and organizations, for the purpose of implementing hazard mitigation projects and measures that are consistent with the state hazard mitigation plan. All such efforts shall be in compliance with existing state and federal laws and regulations, and must receive the approval of the Chair or his or her designee.

6. Members of the council shall not receive compensation, but members may receive necessary expenses for the performance of council functions, based on existing state rates.

The provisions of this Executive Order shall become effective upon filing.

Given under my hand and the Great Seal of the State of Michigan this 29th day of July, in the Year of our Lord, One Thousand Nine Hundred Ninety Eight.

(signed)
GOVERNOR

BY THE GOVERNOR:

(signed)
SECRETARY OF STATE

FILED WITH SECRETARY OF STATE CANDICE S. MILLER ON 7-29-98 AT 10:05AM

EXECUTIVE DIRECTIVE No. 2001 - 5 (ELECTRONIC COPY)

STATE FLOOD HAZARD MITIGATION

DATE: September 11, 2001

TO: All Directors and Agency Heads

FROM: Governor John Engler (signed)

SUBJECT: State Flood Hazard Mitigation

Recent flood events in Michigan are serious reminders that economic losses from flood damage can occur regardless of season and in spite of the current low Great Lakes water levels. Last September's flooding in southeast Michigan resulted in the most expensive Presidential Disaster Declaration in the history of the state of Michigan. The federal and state governments have expended more than $200 million responding to this flood event.

The state of Michigan has extensive and continuous programs for the construction of buildings, roads and other facilities, which influence patterns of commercial, residential and industrial development in flood-prone areas. State agencies play an important role in avoiding the uneconomic, hazardous or unnecessary use of floodplains for activities that impair the beneficial functions of such areas. Furthermore, state agencies, leading by example, can provide local government and the public with a model that allows for optimum floodplain management and the mitigation of existing flood hazards.

Therefore, I direct the Department of Environmental Quality ("DEQ"), as the lead agency, to develop a statewide, inter-agency, flood mitigation strategy to assure compliance with the State Flood Hazard Mitigation Plan. In many respects, this strategy will involve the implementation of aspects of the State Flood Hazard Mitigation Plan, which was originally developed pursuant to the provisions of Executive Order 1977-4 issued by Governor William G. Milliken. The Michigan Hazard Mitigation Coordinating Council, an entity created by Executive Order 1998-5, currently assists in the development, maintenance and implementation of the State Flood Hazard Mitigation Plan.

The DEQ shall develop this strategy in cooperation with the Department of State Police, the Department of Consumer and Industry Services ("CIS"), the Department of Management and Budget ("DMB"), the Department of Transportation, and the Michigan Hazard Mitigation Coordinating Council. Other state departments and agencies shall cooperate in the development of the strategy as requested by DEQ.

In addition to general provisions implementing the State Flood Hazard Mitigation Plan, the mitigation strategy shall specifically include the following:

1. A review of administrative rules promulgated by DEQ found in Part 13 – Floodplains and Floodways, of the DEQ's Water Resources Protection rules, located at R. 323.1311 et seq. of the Michigan Administrative Code. This review shall determine if current regulations adequately prevent state activities that cause the loss of water storage capacity in the state's floodplains. Additionally, the review shall determine if current regulations provide adequate flood resistant construction standards for state riverine and inland lake floodplain construction activities. The

strategy shall recommend changes in the applicable regulations when necessary and appropriate to assure compliance with the State Flood Hazard Mitigation Plan.

2. A review of administrative rules promulgated by DEQ entitled Great Lakes Shorelands located at R. 281.21 et seq. of the Michigan Administrative Code. This review shall determine if current regulations include adequate measures to assure flood resistant construction standards apply to state construction activities in Great Lakes floodplains. The strategy shall recommend changes in the applicable regulations when necessary and appropriate to assure compliance with the State Flood Hazard Mitigation Plan.

3. A review of administrative rules promulgated by the Department of Consumer and Industry Services ("CIS") addressing Land Divisions (R. 560.101 et seq.), Condominium Development (R. 559.101 et seq.) and Mobile Home Park Development (R. 325.3311 et seq.). This review shall determine if current regulations include adequate measures to prevent state development that would cause the state to incur flood damages for floods up to and including a 100-year flood. The strategy shall recommend changes in the applicable regulations when necessary and appropriate to assure compliance with the State Flood Hazard Mitigation Plan.

4. A review of the provisions of the Single State Construction Code Act, Act No. 245 of the Public Acts of 1999, being Section 125.1501 et seq. of the Michigan Compiled Laws, and any administrative rules promulgated by CIS under the act (R. 408.30101 et seq.). This review shall determine if state development in floodplain areas complies with the provisions of the Act and the administrative rules adopted pursuant to the Act. The strategy shall recommend changes in the applicable regulations when necessary and appropriate to assure compliance with the State Flood Hazard Mitigation Plan.

5. The establishment of a coordination mechanism between DMB and DEQ to assure that the construction of buildings and other state facilities avoids the use of flood-prone lands whenever possible and to assure that new state facilities are designed to minimize potential flood damage when necessary and appropriate.

6. The preparation and implementation of an educational program for the general public and local units of government focusing on the need to reduce flood damages.

Flood damage prevention is of great importance to the safety, health and welfare of our citizens. I am confident that state departments and agencies can and will assist in the development of a more effective flood mitigation strategy and thereby minimize the likelihood that state property will be damaged during future flood events.

Thank you for your cooperation.

STATE OF MICHIGAN
Executive Office * Lansing

EXECUTIVE ORDER 1977-4 (ELECTRONIC COPY)

STATE FLOOD HAZARD MITIGATION PLAN

WHEREAS, uneconomic uses of the State's flood plains are occurring and potential flood losses are increasing; and

WHEREAS, the State has extensive and continuing programs for the construction and reconstruction of buildings, roads, and other facilities and annually disposes of hundreds of land parcels that may be flood prone, all of which activities significantly influence patterns of commercial, residential, and industrial development; and

WHEREAS, State land use planning programs are determining factors in the utilization of lands; and

WHEREAS, the Federal Flood Disaster Protection Act of 1973 (P. L. 93-234) and the National Flood Insurance Program requires a state management plan;

NOW, THEREFORE, I, WILLIAM G. MILLIKEN, Governor of the State of Michigan, pursuant to the authority vested in me by the Michigan Constitution, laws of the State of Michigan, and the applicable provisions of P. L. 93-234, hereby order the following:

1. The Department of Natural Resources, Water Management Division is hereby designated as the state agency to supervise and administer the state flood hazard management program. Requests for information or technical assistance to implement the provisions of this Order shall be directed to the Water Management Division.

2. The heads of the State agencies shall provide leadership in encouraging a broad and unified effort to prevent uneconomic uses and development of the State's flood plains and, in particular, to lessen the risk of flood losses in connection with State lands and installations and State financed or supported improvements.

3. To implement this mandate, it is hereby ordered that:

    a) All State agencies directly responsible for the construction of State buildings, structures, roads, or other facilities shall evaluate flood hazards when planning the location of new facilities and, as far as practicable, shall preclude the uneconomic, hazardous, or unnecessary use of flood plains in connection with such facilities.

    b) With respect to existing State owned properties which have suffered flood damage or which may be subject thereto, the responsible agency head shall require conspicuous delineation of past and probable flood heights so as to assist in creating public awareness of the knowledge about flood hazards. Whenever practical and economically feasible, flood proofing measures shall be applied to existing facilities in order to reduce flood damage potential.

    c) All State agencies responsible for the disposal of State lands or properties shall evaluate flood hazards in connection with lands or properties proposed for disposal to non-State public instrumentalities or private interests and, as may be desirable in order to minimize future public expenditures for flood protection and flood disaster relief and as far as practicable, shall attach appropriate restrictions with respect to uses of the lands or properties by the purchaser and his successors and may withhold such lands or properties from disposal.

d) All State agencies responsible for programs which entail land use planning shall take flood hazards into account when evaluating plans and shall encourage land use appropriate to the degree of hazard involved.

4. All flood hazard evaluations shall be based upon a base flood that has a 1% chance of being equaled or exceeded in any given year, commonly known as a 100-year flood.

5. Proposals for new construction, substantial improvements or other developments or alteration within a flood hazard area shall be guided by the following standards:

   a) Encroachments within the floodway of a stream that would result in any increase in flood stage shall be prohibited unless approved by the Department of Natural Resources.

   b) All new construction and substantial improvements shall have the lowest floor (including basement) elevated to or above the base flood level. Non-residential construction may be designed with attendant utility and sanitary facilities so that below the base flood level, the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capacity of resisting hydrostatic and hydrodynamic loads and effects of buoyance. Any utilization of flood proofing techniques shall require a certification from a registered engineer or architect that the flood proofing methods are adequate to withstand the flood depths, hydrostatic pressures, velocities, impact, and uplift pressures associated with the base flood. All certificates indicating the elevation at mean sea level datum to which such structures are flood proofed shall be kept on record within the State agency responsible for the structure.

6. Requests for appropriations for State construction of new buildings, structures, roads, or other facilities shall be accompanied by a statement by the head of the agency on the findings of his agency's evaluation and consideration of flood hazards in the development of such requests. If the construction is in a flood prone area, the statement shall contain a letter of non-objection from the Department of Natural Resources.

7. The State agencies shall proceed immediately to develop such procedures, regulations, and information as are provided for in, or may be necessary to carry out, the provisions of this Order.

Given under my hand and the Great Seal of the State of Michigan this Thirteenth day of May in the Year of Our Lord, One Thousand Nine Hundred and Seventy-Seven and of the Commonwealth One Hundred Forty-One.

(signed by William G. Milliken)
GOVERNOR

BY THE GOVERNOR:

(signed by Richard H. Austin)
Secretary of State

(Article reprinted from "Midwestern Mitigation – Prevention in Action in Region V" newsletter, Volume 3, Issue 1, November 2001, by FEMA Region V – Chicago, Illinois)

State of Michigan Flint River Flood Control

BACKGROUND

The Flint River and its connecting drainage systems, covering the counties of Genesee, Shiawassee, Lapeer, Sanilac, Tuscola, Oakland and Saginaw, have been drastically changed in the last 30 years. These modifications are man-made and not natural. The growth and development of the upstream drainage basin, has radically increased the flow of water into the Flint River channel and has compounded the speed at which water and storm sewers dump into this drainage network. This increases the frequency and intensity of flooding in southern Saginaw County.

While the upstream community has changed rapidly, rural areas and farm ground downstream toward Saginaw County have not changed fast enough to cope with the increased volume of drainage water. There are Centennial farms in the area that had never lost a harvest to flooding until the 1980's. Governor Blanchard in 1985 ordered the National Guard to repair area dikes because of the potential health hazards. (Approximately 10,000 acres were inundated for over two weeks)

The project of flood control became obvious due to the frequent and devastating flooding to the community. The extensive economic losses, health, and safety risks were unbearable. Residents had to evacuate homes, suffer household damage, and lose income due to work days lost. Financial losses to farmers in 1985 totaled $1,600,000.00, while in 1986 losses of crops alone totaled an additional $2,805,760.00.

The consequences of flooding are numerous. Completion of the reconstruction of dikes is necessary for the prevention of flooding. Reconstruction of the dikes will protect 340 homes and at least 6 commercial businesses and 72 business landowners. Completion of dikes will prevent contamination to households, wells crops, soils and restore safety and productivity to the community. **(During flooding and high flow occasions, millions of gallons of raw sewage is released and by-passed into the Flint River from upstream wastewater treatment plants.)**

Communities and farmers south of Saginaw and downstream from Flint, in order to protect their land and homes, have formed a four-township Flood and Erosion Control board to institute flood protection for the area. The Flint River Project encompasses 8 miles of river, 11,145 of prime agricultural land, 340 homes, and 16 miles of riverbank.

PROJECT

FEMA funds from Disaster #1128 were utilized to accomplish the following work in Section 35, Spaulding Township, Saginaw County, Michigan:

Relocate existing earthen dikes and excavate a floodway shelf along the Flint River involving about 410,000 cubic yards of material. The excavated material will be used for the construction of about 46,500 lineal feet of proposed dikes. Stabilize, with rip-rap underlain by filter fabric, upstream and downstream ends of two existing overflow channels; excavate an overflow channel about 1150 feet in length, and stabilize upstream and downstream ends with rip-rap underlain by filter fabric.

BENEFITS

Without mitigation improvements, the average annual damage to dikes, crops, homes, roads, bridges and other property is $2.8 Million. It is conservatively estimated over $100,000,000.00 in damages has occurred over the past 100 years.

A total of $2.80 Million has been spent on flood improvements to date with an additional $2.26 Million required to complete the project. The ratio of damages ($100,000,000.00) to total project costs ($5.06 Million) is nearly 20 to 1.

On February 8, 2001, a major storm event occurred during frozen ground conditions. This event was recorded as the third highest flow event since 1948 from MDNR gage stations. With the improvements in place from funds associated with Disaster #1128, damages in the amount of $2,836,400.00 were prevented (20 x $141,820.0 project cost)!

FUNDING SOURCES

FEMA Hazard Mitigation Grant Program; Michigan Department of Commerce Block Grant; Michigan Department of Agriculture; Natural Resources Conservation Service; Local Township Assessments

Flood Proof
Grants enable Vassar residents to raise homes out of harm's reach

By Tom Gilchrist
TIMES WRITER

VASSAR - Nine-year-old Branden Katt's classmates have reminded him he lives in a flood zone since he and his parents moved into a home along North Cass Avenue in Vassar in 1998.

This month, however, workers around Branden's home have given his spirits a boost.

Lonnie and Michelle Katt's entire 90-ton home is 10 feet off the ground, awaiting a new foundation that will end up boosting the house 7 feet higher than before.

"The kids at school would always tell my kids, 'You live by the flood,'" Michelle Katt said. "Branden would always become very concerned when it would rain."

"Now he is feeling pretty good."

Federal grant money largely financed the raising of the home, intended to flood-proof the dwelling that sits between the Cass River and Moore Drain in the Tuscola County city of Vassar, long known for its floods.

The $113,312 grant from the Federal Emergency Management Agency will pay for flood-proofing four homes, including the Katt residence at 321 N. Cass Ave.

During past years, federal money has helped pay for relocation of several other Vassar homes, or for the city's purchase and demolition of other houses near the Cass River.

During floods, water from the Moore Drain and the river rises into both homes and businesses in downtown Vassar.

The city flooded in 1997 and in 1996, but one of the city's worst floods occurred in 1986, when water rose 11 feet above flood stage, an all-time record, according to the National Weather Service.

The 1986 flood damaged dozens of stores and homes, with water 8 or more feet high inside some Vassar businesses.

"Some people say, 'Why do you want to raise the house up higher? That will look silly,'" said Michelle Katt, 34, who is spending nights with her husband in a camper trailer next to the family home while waiting for workers to build a new concrete-block foundation beneath the house.

"I like the town and I like the schools," Michelle Katt said. "My husband has put a lot of work into the interior of the home since we bought it, and we totally landscaped around the outside of the home."

Workers from D & M House Moving Inc. of Pinconning have lifted the home into the air, using a network of metal beams and wooden cribbing placed beneath the structure.

The Katts' two children - Branden and 6-year-old Briana Katt - are staying with Michelle Katt's mother, Judy Touchette of Lapeer, as workers build new footings and foundation walls for the Katt home.

City-owned vacant lots - where homes once sat - exist on both sides of the Katts' house. Across Cass Avenue, the city's Riverside Park abuts the Cass River. Homes once sat on the park land, too.

"The city has to mow grass and maintain a property after a home is moved or demolished, and the city owns so much land that it seems like all we do is cut grass," said Vassar City Manager Brian M. Kischnick.

"You lose tax base when a home leaves, but you gain the cost of maintenance and liability for the land," Kischnick said.

"Some people don't like the idea of elevating homes because the houses are so high they look out of character."

"One side of me says they're right, but the other side says these people are doing things with their homes where you can't even tell (the homes have been elevated)."

Lonnie and Michelle Katt plan to have workers build a garage and storage area beneath their elevated home. Tiered stairways will lead away from the front porch to make the view more inviting, and lattice will cover the new concrete-black foundation.

Workers will build small floodgates into the elevated home's supporting walls so the Katts can let water pass through the garage area and relieve pressure on the home's exterior walls in a flood.

"We might have to take a canoe to our house, but if it floods again, at least our living space will be dry," Michelle Katt said.

(Vassar home elevation photos by Lt. Harry Partridge, EMD/MSP 3rd District Coordinator)

Michigan Hazard Analysis: Summary of Hazard Impacts*

(December 2001 Edition)

HAZARD	Historical Frequency of Major Events (Approximation)	Deaths from Major Events	Injuries from Major Events	Property Damage from Major Events (Best Available Estimates)	Typical Impact Area	Risk Rating - Human Life	Risk Rating - Property Damage
Civil Disturbances	1 major disturbance app. every decade; 1 major prison uprising every 20-25 years	34 (1943); 43 (1967); prison = 1 (1952)	700+ (1943); 1,000+ (1967); prison = 189 (1952, 1981)	$50 million+ (1967); prison = $11.6 million	Local	Low - Moderate	Moderate
Drought	1 major event every 20-25 years	N/A	N/A	N/A	Regional - Statewide	Low	Low (Agricultural = High)
Earthquakes	Michigan has not had a major earthquake to date	N/A	N/A	N/A	Local - Regional	Low	Low
Energy Emergencies	Major short-term local or regional disruptions caused by weather, accidents or equipment failure: app. 1-3 per year; longer-term regional or national disruptions caused by a sudden price increase or other factor: 1999/2000, 1979/80, 1976/77, 1973/74 – app. 1 event every decade since 1970	N/A	N/A	N/A	Regional - Statewide	Low – Moderate (depending on length of emergency and the time of year)	Low
Extreme Temperatures	Extreme temperature periods occur every year; Michigan has 90-180+ days per year below freezing	570 (1936); (nationally, 200 deaths per year from extreme heat; 700 deaths per year from extreme cold)	N/A	N/A	Regional - Statewide	Moderate - High	Low (Agricultural = Low-Moderate)
Fire Hazards:							
Scrap Tire Fires	Varies; from 1987-97, 6 major events	None	None	N/A (however, suppression time/costs are significant)	Local	Low	Low
Structural Fires	22,000 fires in 1998 (1 fire every 27.5 minutes); catastrophic structural fires in 1927, 1934, 1951	213 in 1998; (nationally, 5,000 per year); catastrophic structural fire losses: 21 (1927) 34 (1934)	669 in 1998; nationally, 25,000 per year	$400 million in 1998; nationally, $9 billion per year	Local	High	High
Wildfires	MDNR involvement = 1 major event app. every decade	500+/- (since 1871)	N/A	N/A	Local	Low - Moderate	Moderate - High (Very High for timber loss)

Michigan Hazard Analysis: Summary of Hazard Impacts*

(December 2001 Edition)

HAZARD	Historical Frequency of Major Events (Approximation)	Deaths from Major Events	Injuries from Major Events	Property Damage from Major Events (Best Available Estimates)	Typical Impact Area	Risk Rating - Human Life	Risk Rating - Property Damage
Flooding Hazards:							
Dam Failures	278 failures documented (none catastrophic); 2,400 dams identified statewide	N/A	N/A	N/A	Local - Regional	Moderate - High	Moderate - High
Riverine Flooding	1 major flood every 2 years	Less than 10 over the past 25 years; nationally, 140 per year	N/A	$60-100 million per year for all flooding; $475 million in major riverine events since 1975	Local - Regional	Low	High
Great Lakes Flooding	1 major flooding cycle app. every decade; (10% of Michigan's shoreline is floodprone – in 30 counties = 45,000+acres)	N/A	N/A	$60-100 million per year for all flooding	Local - Regional	Low	High
Hazardous Material Fixed Site Incident (including major hazardous material-related industrial accidents)	1 reportable incident every 15.2 days	Industrial accidents: 21 (1927) 18 (1999 – 3 events) 5 (2000 – 1 event)	Industrial accidents: 14 (1999 – 1 event) 32 (2000 – 1 event) 16 (2001 – 2 events @ same plant)	Industrial accidents: $1 billion+ (1999 – 1 event); Hazardous Material Fixed Site Incidents: (minimal except in cases of explosion)	Local	Low - Moderate (for surrounding areas); higher for on-site personnel	Low (for most incidents); Moderate-High (in cases of large industrial explosions)
Hazardous Material Transportation Incident	1 reportable incident every 9.1 days	N/A	N/A	N/A	Local	Low - Moderate (for surrounding areas); may be higher for operator and responders	Low
Infrastructure Failures	Varies greatly by type of facility; some occur almost annually (i.e., major power failures)	N/A	N/A	$250 million in recent Federally-declared disasters (1028, 1128, 1346)	Local - Regional	Low	Low - High (depends on type of failure)
Nuclear Attack	Never occurred in United States; only once worldwide (Japan, 1945)	None	None	None	Statewide	Very High	Very High
Nuclear Power Plant Accidents	One in United States (TMI, 1979); major accident in USSR (Chernobyl, 1986)	None	None	None	Local - Regional	Moderate - High (long-term effects from radiation exposure)	Low

Michigan Hazard Analysis: Summary of Hazard Impacts*

(December 2001 Edition)

HAZARD	Historical Frequency of Major Events (Approximation)	Deaths from Major Events	Injuries from Major Events	Property Damage from Major Events (Best Available Estimates)	Typical Impact Area	Risk Rating - Human Life	Risk Rating - Property Damage
Oil/Gas Well Accidents	1 major accident every 3-4 years (since 1973)	Minimal – 1 from recent major accident	Minimal - 2 from recent major accidents	N/A	Local	Low - Moderate (for surrounding areas); may be higher for operator and responders	Low
Petroleum/Gas Pipeline Accidents	1 major accident per decade; minor accidents much more frequent (several per year)	10 since 1975 (figure would be higher if all minor accidents were accounted for)	34 since 1975 (figure would be higher if all minor accidents were accounted for)	N/A	Local	Low - Moderate (for surrounding areas); may be higher for operator and responders	Low (for public and private property); higher for pipeline company property
Public Health Emergencies	Varies greatly by type of emergency; 4 major incidents since 1973	N/A (21 nationwide from the 1998-99 Listeriosis outbreak originating in Michigan)	327 from 3 of the major incidents since 1973; (long-term effects of PBB contamination are unknown); (100 nationwide from the 1998-99 Listeriosis outbreak)	N/A	Local - Statewide	Low - High (varies by type of emergency)	Low
Sabotage/Terrorism	4 major incidents in Michigan's history (Bath, 1927; Pontiac, 1971; East Lansing, 1992 and 1999); nationally, numerous incidents in recent years	In Michigan, 41; (nationally, 4,600+ in major incidents since 1970; if all incidents were accounted for, the figure would be higher)	In Michigan, 58; nationally, nearly 11,000 in major incidents since 1970; (if all incidents were accounted for, the figure would be higher)	N/A (several billion, just from major incidents)	Local - Regional	High, in impacted area (randomness of targets and actions makes it difficult to establish a definitive risk rating); High, if deadly agents are used	High, if explosives are used in the attack
Subsidence	Major incidents that lead to catastrophic damage are rare in Michigan; smaller incidents occur with regularity in old mining areas	None	None	Nationally, $125 million per year	Local (single sites, typically)	Low (due to limited nature of impact area)	Low - Moderate (due to limited nature of impact area)
Thunderstorm Hazards:	**20-60** thunderstorm days per year in Michigan: **40-60** days per year in the southern two tiers of counties of the Lower Peninsula; **30-40** days per year, in general, in the Lower Peninsula; **20-30** days per year in the Upper Peninsula.						

Michigan Hazard Analysis: Summary of Hazard Impacts*

(December 2001 Edition)

HAZARD	Historical Frequency of Major Events (Approximation)	Deaths from Major Events	Injuries from Major Events	Property Damage from Major Events (Best Available Estimates)	Typical Impact Area	Risk Rating - Human Life	Risk Rating - Property Damage
Hail	20-60 thunderstorm days per year; 1 major hail event app. every 2-3 years	Difficult to determine due to other thunderstorm impacts that may contribute to deaths	Difficult to determine due to other thunderstorm impacts that may contribute to injuries	NCDC records list $27.9 million in property and crop damage from hail since 1993 – an average of $3.1 million per year; (Note: these figures are conservative; the actual totals are likely to be higher)	Local - Regional	Low (for just hail alone)	Moderate - High
Lightning	20-60 thunderstorm days per year	99 (1959-July 2001); app. 2.3 deaths per year from lightning	693 (1959-July 2001); app. 16.1 injuries per year from lightning	Nationally, several billion dollars per year; NCDC records list $17.7 million in damage since 1993 alone – an average of $2 million per year; (Note: these figures are conservative; the actual totals are likely to be higher)	Local - Regional	Moderate - High	High
Severe Winds	On average, severe wind events can be expected **2-3 times** per year in the Upper Peninsula, **3-4 times** per year in the northern Lower Peninsula, and **5-7 times** per year in the southern Lower Peninsula.	115 (1970-July 2001); app. 3.6 deaths per year from severe winds	660+ in major wind events since 1970; app. 20.5 injuries per year from severe winds	$260+ million in public and private damage from major wind events since 1980; NCDC records list $285+ million in property and crop damage from severe winds since 1993 alone – an average of $31.7 million per year; (Note: these figures are conservative; the actual totals are likely to be higher)	Local - Regional	Moderate	Moderate - High
Tornadoes	927 from 1950-July 2001 (an average of 18 per year)	239 (1950-July 2001); app. 5 deaths per year from tornadoes	3,332 (1950-July 2001); app. 64 injuries per year from tornadoes	Nearly $700 million since 1950 – an average of $13.5 million per year (Note: these figures are conservative; the actual totals are likely to be higher)	Local	High	High

Michigan Hazard Analysis: Summary of Hazard Impacts*

(December 2001 Edition)

HAZARD	Historical Frequency of Major Events (Approximation)	Deaths from Major Events	Injuries from Major Events	Property Damage from Major Events (Best Available Estimates)	Typical Impact Area	Risk Rating - Human Life	Risk Rating - Property Damage
Transportation Accidents (Passenger)	5 major air transport crashes since 1958; 1 major passenger train accident (1993); 5 major land transport accidents (1999-2001); no major water transport accidents	250 from major air transport crashes since 1958; 1 from a school bus accident in 2000; none from other major transport accidents	22 from major air transport crashes since 1958; 2 from the 1993 passenger train accident; 116 from the 1999-2001 land transport accidents	N/A	Local	Low (when compared to automobile travel)	Low
Severe Winter Weather:	90-180 days per year below freezing in the Lower Peninsula; 180+ days in the central and western Upper Peninsula						
Ice/Sleet Storms	40 major storm events from 1970-July 2001 (an average of just over 1 major storm event per year)	N/A (Difficult to determine because many deaths are caused by automobile accidents, heart attacks from overexertion, downed power lines, and other secondary impacts)	N/A	Over $100 million in damage from major storms since 1976; NCDC records list $35.8 million in damage since 1993 alone – an average of $4 million per year; (Note: these figures are conservative; the actual totals are likely to be higher)	Local - Regional	Low from direct storm impacts (Note: factoring in traffic accidents, heart attacks and other secondary impacts would increase the rating to Moderate)	Moderate - High
Snowstorms	8 major regional or statewide snowstorms since 1967 – an average of 1 major snowstorm app. every 5 years; (Note: numerous snowstorms that occur in the Upper Peninsula and northern Lower Peninsula on a regular basis would likely be considered major snowstorms in the southern Lower Peninsula, where average annual snowfall totals are much lower and the affected population is much higher)	N/A (Difficult to determine because many deaths are caused by automobile accidents, heart attacks from overexertion, and other secondary impacts)	N/A	N/A	Local - Statewide	Low from direct storm impacts (Note: factoring in traffic accidents, heart attacks and other secondary impacts would increase the rating to Moderate)	Low

MICHIGAN HAZARD ANALYSIS
2001 Hazards Rankings*

Most Frequent Major Events

Hazard	Frequency	Comments
Structural Fires	1 structural fire every 27.5 minutes.	Most are single structure events only.
Ice/Sleet Storms	1 major storm event approximately every year.	Occur primarily in January, February, March and April.
Severe Winds	On average, severe wind events can be expected 2-3 times per year in the Upper Peninsula; 3-4 times per year in the northern Lower Peninsula; 5-7 times per year in the southern Lower Peninsula.	Includes winds of 58+ miles per hour from thunderstorms, blizzards, etc., but not tornadoes.
Hazardous Material Transportation Incident	1 reportable incident every 9.1 days.	Most do not result in significant evacuations, property damage, etc.
Hazardous Material Fixed Site Incident	1 reportable incident every 15.2 days.	Most do not result in significant evacuations, property damage, etc.
Thunderstorms	20-60 thunderstorm days per year – an average of 1 thunderstorm day every 6-18 days, depending on location.	Occur primarily during the spring and summer months.
Tornadoes	18 tornadoes per year – 1 every 20 days, on average.	Occur primarily during the spring and summer months.
Riverine Flooding	1 major flood approximately every 2 years.	May cause significant evacuations and property damage.

Most Deaths

Hazard	Number of Deaths	Comments
Structural Fires	213 in 1998 – an average of 1 death every 2 days; fire death rate = 21.1 persons per million population.	Fire death rate ranks 16th nationally, 2nd in Midwest.
Extreme Temperatures	570 in 1936 heat wave – others have occurred sporadically; an average of nearly 9 deaths per year from the 1936 figures alone.	Statistics difficult to compile because temperature-related deaths are not always reported as such.
Transportation Accidents (air transport crashes)	250 since 1958 – an average of nearly 6 deaths per year.	Death tolls resulted from 5 crashes.
Tornadoes	239 since 1950 – an average of nearly 5 deaths per year.	Death tolls significantly influenced by June 8, 1953 and April 11, 1965 tornadoes, which resulted in 168 deaths.
Extreme Temperatures	570 in the July 1936 heat wave alone – an average of nearly 9 deaths per year.	Nationally, the July 1936 heat wave caused 5,000 deaths.
Wildfires	500+ since 1871 – an average of nearly 4 per year.	Most deaths occurred in the 1871 and 1881 wildfires.
Severe Winds	115 since 1970 – an average of 3.6 deaths per year.	N/A
Lightning	99 since 1959 – an average of 2.3 deaths per year.	Lightning deaths rank 12th nationally.
Civil Disturbances	77 in non-prison disturbances since 1943 – an average of just over 1 death per year.	Deaths occurred in the 1943 and 1967 riots in Detroit.
Industrial Accidents	44 since 1927 – an average of just over 1 death every two years.	Deaths occurred in major accidents in 1927, 1999 (3 events), and 2000.
Sabotage/Terrorism	41 since 1927 – an average of 1 death every two years.	Deaths occurred in 1927 Bath school explosion.

MICHIGAN HAZARD ANALYSIS
2001 Hazards Rankings*

Most Injuries

Hazard	Number of Injuries	Comments
Structural Fires	669 in 1998 – an average of 1.8 injuries per day.	N/A
Tornadoes	3,332 since 1950 – an average of 64 injuries per year.	N/A
Transportation Accidents (Passenger)	116 in major land transport accidents since 1999 – an average of nearly 39 injuries per year; 22 from major air transport crashes since 1958 – an average of 1 injury every 2 years.	Includes only major accidents; if all accidents were included, the totals would be higher.
Civil Disturbances	1,700+ in non-prison disturbances since 1943 – an average of just over 29 injuries per year.	Conservative estimate; only includes injuries attributable to major disturbances such as the 1943 and 1967 Detroit riots.
Industrial Accidents	62 in major accidents since 1999 – an average of just over 20.6 injuries per year.	Injuries occurred in 4 major accidents.
Severe Winds	660+ since 1970 – an average of just over 20.5 injuries per year.	N/A
Lightning	693 since 1959 – an average of 16.5 injuries per year.	Lightning injuries rank 2nd nationally.
Public Health Emergencies	327 from 3 major incidents since 1973 – an average of nearly 12 injuries per year.	Only readily evident injuries are included.
Petroleum/Gas Pipeline Accidents	34 in major accidents since 1975 – an average of 1.3 injuries per year.	Conservative estimate; only includes injuries attributable to major accidents.
Sabotage/Terrorism	58 since 1927 – an average of 1 injury approximately every 1.3 years.	Injuries occurred in 1927 Bath school explosion.

Most Property Damage

Hazard	Property Damage	Comments
Structural Fires	$400 million in 1998 – an average of $1.1 million per day.	Approximately 75% of all fire losses are structural fire related.
Infrastructure Failures	$250 million in federally declared infrastructure failure disasters since 1994 – an average of $35.7 million per year.	
Riverine/Great Lakes Flooding	$60-100 million per year for all flooding; $475 million in major riverine floods since 1975 – an average of nearly $18.3 million per year.	Annual damage figures for all flooding based on Michigan Department of Environmental Quality estimates.
Severe Winds	$260+ million in public and private damage from major wind events since 1980 – an average of nearly $12 million per year. NCDC records list $285+ million in damage since 1993 alone – an average of $31.7 million per year.	Conservative estimates; the actual totals are likely to be higher.
Tornadoes	$700 million in public and private damage from tornadoes since 1950 – an average of $13.5 million per year.	Conservative estimates; the actual totals are likely to be higher.
Ice/Sleet Storms	$100+ million in public and private damage from major storm events since 1976 – an average of $4 million per year. NCDC records list $35.8 million in damage since 1993 alone – an average of $4 million per year as well.	Conservative estimates; the actual totals are likely to be higher.
Lightning	National estimates indicate several billion dollars per year. NCDC records list $17.7 million in damage since 1993 alone – an average of $2 million per year.	Statistics compiled by many different sources using widely varying collection methods and criteria; establishing a collective damage figure for the U.S. is difficult.
Sabotage/Terrorism	National estimates indicate several billion dollars just from major events.	N/A

MICHIGAN HAZARD ANALYSIS
2001 Hazards Rankings*

Largest Impact Area

Hazard	Typical Impact Area	Comments
Nuclear Attack	Statewide	N/A
Drought	Regional-Statewide	N/A
Extreme Temperatures	Regional-Statewide	N/A
Snowstorms	Local-Statewide	N/A
Public Health Emergencies	Local-Statewide	N/A
Energy Emergencies	Local-Statewide	N/A

Risk Rating: Human Life

Hazard	Risk Rating	Comments
Nuclear Attack	Very High	All-out attack could be catastrophic in terms of loss of life (from direct weapons effects and the resulting radiation).
Structural Fires	High	Michigan's fire death rate = 21.1persons per million population, ranking it in the top 25% of all states in the U.S., and 2nd in the Midwest.
Tornadoes	High	Extreme risk for unprotected individuals in storms path; lack (often) of adequate warning time adds to risk to human life.
Lightning	High	Michigan's lightning death total of 97 and injury total of 691 since 1959 rank it in the top one-third and top five, respectively, in the U.S.
Extreme Temperatures	Moderate-High	Prolonged heat waves are particularly dangerous, especially on the most vulnerable segments of the population – the elderly, children, impoverished individuals, and people in poor health.
Dam Failures	Moderate-High	Risk depends on nature, composition, and size of hydraulic "shadow/footprint" and amount of water impounded by dam.
Nuclear Power Plant Accidents	Moderate-High	Long-term effects from radiation exposure in the event of a catastrophic accident.

MICHIGAN HAZARD ANALYSIS
2001 Hazards Rankings*

Risk Rating: Property Damage

Hazard	Risk Rating	Comments
Nuclear Attack	Very High	All-out attack could be catastrophic in terms of property damage (within the direct weapons effects areas). Outside those areas, property damage would be significantly less severe.
Structural Fires	High	Nearly $400 million in structural fire losses in Michigan in 1998. Since 1975, total fire losses have increased over 300%.
Riverine/Great Lakes Flooding	High	$60-100 million per year in flood-related losses in Michigan. The Michigan Department of Environmental Quality estimates that 6% of Michigan's land is prone to flooding (containing app. 200,000 buildings). In addition, the MDEQ estimates that app. 10% of Michigan's Great Lakes shoreline (30 counties encompassing more than 45,000 acres) is floodprone.
Severe Winds	Moderate-High	$260+ million in public and private damage from major wind events since 1980 – an average of nearly $12 million per year. NCDC records list $285+ million in property and crop damage from severe winds since 1993 alone – an average of $31.7 million per year. (Note: these figures are conservative; the actual totals are likely to be higher.)
Tornadoes	High	Damage tends to be localized, but severe. $700 million in damage from tornadoes since 1950 – an average of $13.5 million per year. (Note: these figures are conservative; the actual totals are likely to be higher.)
Ice/Sleet Storms	Moderate-High	$100+ million in public and private damage from major storm events since 1976 – an average of $4 million per year. NCDC records list $35.8 million in damage since 1993 alone – an average of $4 million as well. (Note: these figures are conservative; the actual totals are likely to be higher.)
Hail	Moderate-High	Damage generally localized, but costly in terms of repairs to roofs, windows, vehicles, etc. NCDC records list $27.9 million in property and crop damage from hail since 1993 – an average of $3.1 million per year. (Note: these figures are conservative; the actual totals are likely to be higher.)
Lightning	High	National estimates indicate several billion dollars per year in property losses due to lightning strikes. NCDC records list $17.7 million in damage since 1993 alone – an average of $2 million per year.
Wildfires	Moderate-High	Northern Michigan wildland areas rapidly populating. Property values in these wildfire areas are rapidly increasing. The exposure and vulnerability to wildfires in Northern Michigan continues to increase. Depending on location, wildfires can be very costly in terms of timber losses.
Dam Failures	Moderate-High	Risk depends on nature, composition, and size of hydraulic "shadow/footprint" and amount of water impounded by dam.

*Based solely on the data available in the 2001 Michigan Hazard Analysis. Data periods vary by hazard. For some hazards, certain data may not be readily available. If such data were available, these rankings would likely change somewhat. Hazards are not necessarily ranked in exact order of severity. Risk ratings are subjective and take into account the universe of factors examined in this chart.

PRESIDENTIAL DECLARATIONS* 1974-2001

Date of Incident	Type of Incident	Affected Area	Type of Declaration
12/11-31/00	Blizzard, snowstorm	39 counties: Allegan, Barry, Bay, Berrien, Branch, Calhoun, Cass, Clare, Clinton, Eaton, Genesee, Gladwin, Gratiot, Hillsdale, Huron, Ingham, Ionia, Isabella, Jackson, Kalamazoo, Kent, Lapeer, Livingston, Macomb, Mecosta, Midland, Montcalm, Muskegon, Oakland, Osceola, Ottawa, Saginaw, St. Clair, St. Joseph, Sanilac, Shiawassee, Tuscola, Van Buren, & Washtenaw Co.	Emergency
9/10-11/00	Urban Flooding	2 counties: Wayne & Oakland Co.	Major Disaster
5/2-10/99	Forest Fire	2 counties: Marquette & Mackinac Co. (Grant Recipient: Michigan Dept. of Natural Resources)	Fire Suppression
1/2-15/99	Blizzard, snowstorm	31 counties: Alcona, Allegan, Arenac, Barry, Berrien, Cass, Crawford, Ionia, Iosco, Jackson, Kalamazoo, Kent, Lenawee, Macomb, Marquette, Mecosta, Monroe, Montmorency, Muskegon, Newaygo, Oakland, Oceana, Ogemaw, Osceola, Oscoda, Otsego, Ottawa, St. Joseph, Van Buren, Washtenaw, & Wayne Co.	Emergency
7/21/98	Thunderstorms & high winds	2 counties: Macomb & Wayne Co.	Major Disaster
5/31/98	Thunderstorms & high winds	13 counties: Bay, Clinton, Gratiot, Ionia, Kent, Mason, Montcalm, Muskegon, Newaygo, Oceana, Ottawa, Saginaw & Shiawassee Co.	Major Disaster
7/2/97	Tornadoes & flooding	5 counties: Genesee, Macomb, Oakland, Saginaw & Wayne Co.	Major Disaster
6/21-7/1/96	Rainstorms, flooding & tornado	7 counties: Bay, Lapeer, Midland, Saginaw, Sanilac, St. Clair, & Tuscola Co.	Major Disaster
12/93-5/94	Underground freeze	10 counties: Charlevoix, Cheboygan, Chippewa, Delta, Gogebic, Houghton, Mackinac, Marquette, Ontonagon, & Schoolcraft Co.	Major Disaster
9/10-19/86	Flooding	30 counties: Allegan, Arenac, Bay, Clare, Clinton, Genesee, Gladwin, Gratiot, Huron, Ionia, Isabella, Kent, Lake, Lapeer, Macomb, Manistee, Mason, Mecosta, Midland, Montcalm, Muskegon, Newaygo, Oceana, Osceola, Ottawa, Saginaw, Sanilac, Shiawassee, Tuscola, & Van Buren Co.	Major Disaster
9/5-6/85	Flooding	6 counties: Alcona, Genesee, Iosco, Lapeer, Saginaw & Shiawassee Co.	Major Disaster
3/12-20/82	Flooding	2 counties: Berrien & Monroe Co.	Major Disaster
7/15-20/80	High winds	10 counties: Allegan, Berrien, Calhoun, Cass, Jackson, Ottawa, St. Joseph, Van Buren, Washtenaw, & Wayne Co.	Major Disaster
5/13/80	Tornado	2 counties: Kalamazoo & Van Buren Co.	Major Disaster
1/26-27/78	Blizzard, snowstorm	Statewide	Emergency
1/26-31/77	Blizzard, snowstorm	15 counties: Allegan, Barry, Berrien, Cass, Chippewa, Hillsdale, Kalamazoo, Kent, Monroe, Muskegon, Newaygo, Oceana, Ottawa, St. Joseph, & Van Buren Co.	Emergency
3/20/76 3/2-7/76	Icestorms, tornadoes	29 counties: Allegan, Bay, Clare, Clinton, Genesee, Gladwin, Gladwin, Gratiot, Ionia, Isabella, Jackson, Kent, Lapeer, Macomb, Mecosta, Midland, Montcalm, Muskegon, Newaygo, Oakland, Oceana, Osceola, Ottawa, Roscommon, Saginaw, St. Clair, Sanilac, Shiawassee, Tuscola, & Wayne Co.	Major Disaster
8/20/75-9/6/75	Rainstorms, high winds, flooding	16 counties: Allegan, Clare, Genesee, Gratiot, Ingham, Isabella, Mecosta, Midland, Montcalm, Muskegon, Newaygo, Oceana, Osceola, Ottawa, Saginaw, & Shiawassee Co.	Major Disaster
4/18-30/75	Flooding, rain, tornadoes	21 counties: Allegan, Barry, Berrien, Calhoun, Clinton, Crawford, Eaton, Genesee, Ingham, Ionia, Kalamazoo, Kent, Lapeer, Livingston, Macomb, Oakland, Ottawa, Saginaw, St. Clair, Shiawassee, & Van Buren Co.	Major Disaster
4/3/74	Tornado	1 county: Hillsdale Co.	Major Disaster

TOTALS FOR 1974-2001: 20 EVENTS (15 Major Disaster Declarations; 4 Emergency Declarations; 1 Fire Suppression Declaration)

* under P.L. 93-288, as amended. Does not include separate Secretary of Agriculture or Small Business Administration (SBA) disaster declarations, which are issued under other authorities.

GOVERNOR'S DECLARATIONS* 1977-2001

Date of Declaration	Type of Incident	Affected Area	Type of Declaration
		2000-01	
12/29/01	Heavy snow	Emmet Co.	Emergency
10/26/01	Severe winds	Kalamazoo Co.	Disaster
3/9/01	Flooding	Genesee Co.	Disaster
9/20/00	Urban Flooding	Wayne Co.	Disaster
6/7/00	Gasoline Pipeline Rupture	Blackman Twp. (Jackson Co.)	Emergency
2000-01 TOTAL:		**5 EVENTS**	
		1990-99	
8/5/99	Subsidence (Mine Shaft Cave In)	Dickinson Co.	Emergency
7/5/99	Tornado	Oscoda Co.	Disaster
1/15/99	Blizzard; snowstorm	City of Detroit (Wayne Co.)	Emergency
9/27/98	High winds	Otsego Co.	Emergency
9/1/98	Thunderstorms & high winds	City of Niles (Berrien Co.)	Emergency
7/24/98 7/23/98	Thunderstorms & high winds	Wayne Co.; City of Dearborn (Wayne Co.); City of Warren (Macomb Co.)	Disaster
6/5/98 6/4/98 6/3/98	Thunderstorms & high winds	Bay, Clinton, Gratiot, Ionia, Kent, Mason, Mecosta, Montcalm, Muskegon, Newaygo, Oceana, Ottawa, Saginaw, & Shiawassee Co.; Village of Armada (Macomb Co.)	Disaster
4/1/98	Flooding	Alpena Co.	Emergency
7/6/97 7/3/97	Tornadoes & flooding	Genesee, Macomb, Oakland & Wayne Co.; City of Detroit (Wayne Co.); Village of Chesaning (Saginaw Co.)	Disaster
6/27/97	Rainstorms & flooding	Allegan & Ottawa Co.	Disaster
6/26/96 6/21/96	Rainstorms, flooding & tornado	Bay, Lapeer, Saginaw, Sanilac, St. Clair, & Tuscola Co.; City of Midland (Midland Co.)	Disaster
5/22/96	Flooding	Berrien Co.	Disaster
12/13/95	Snowstorm	City of Sault St. Marie (Chippewa Co.)	Emergency
7/8/94	Flooding	Tuscola & Sanilac Co.	Disaster
3/10/94 3/4/94 2/25/94 2/23/94	Underground freeze	Charlevoix, Cheboygan, Chippewa, Delta, Gogebic, Houghton, Mackinac, Marquette, Ontonagon, & Schoolcraft Co.	Emergency
4/20/93	Flash flood	Shiawassee Co.	Disaster
7/16/92	Heavy rain	Gogebic Co.	Disaster
7/14/92	Tornado	Cass Co.	Disaster
10/6/90	Tornado	Genesee Co.	Disaster
9/16/90	Ship explosion & fire	Bay Co.	Emergency
5/9/90	Forest fire	Crawford Co.	Emergency
1990-99 TOTAL:		**21 EVENTS**	

GOVERNOR'S DECLARATIONS* 1977-2001 (cont.)

Date of Declaration	Type of Incident	Affected Area	Type of Declaration
		1980-89	
6/8/89	Flooding, high winds	Branch, Kalamazoo & St. Joseph Co.; Village of Manchester (Washtenaw Co.)	Disaster
6/9/88	Fire	City of Corunna (Shiawassee Co.)	Disaster
8/18/87	Airline crash	City of Romulus (Wayne Co.)	Disaster
10/28/86 9/15/86 9/12/86	Flooding, heavy rain	Allegan, Arenac, Bay, Clare, Clinton, Genesee, Gladwin, Gratiot, Huron, Ionia, Isabella, Kent, Lake, Lapeer, Macomb, Manistee, Mason, Mecosta, Midland, Montcalm, Muskegon, Newaygo, Oceana, Osceola, Ottawa, Saginaw, Shiawassee, Tuscola, & Van Buren Co.	Disaster
2/21/86	Great Lakes flooding & wave action	Allegan, Arenac, Bay, Berrien, Grand Traverse, Iosco, Macomb, Marquette, Menominee, Monroe, Muskegon, Ottawa, Saginaw, St. Clair, Tuscola, Van Buren, & Wayne Co.	Disaster
9/13/85	Heavy rain, flash flood	Alcona Co.	Disaster
9/10/85	Heavy rain, flooding	Genesee, Lapeer, & Saginaw Co.	Disaster
4/13/85	Great Lakes flooding & wave action	Arenac, Bay, Macomb, Monroe, Saginaw, St. Clair, Tuscola, & Wayne Co.	Disaster
1/15/85	Icestorm	Allegan, Barry, Berrien, Calhoun, Eaton, Genesee, Ingham, Jackson, Kalamazoo, Lapeer, Livingston, Oakland, & Van Buren Co.	Disaster**
7/15/83	Forest fire	Schoolcraft Co.	Disaster
3/19/82	Flooding	Berrien & Monroe Co.	Disaster
7/21/80	Thunderstorms, high winds	Allegan, Berrien, Calhoun, Cass, Jackson, St. Joseph, Van Buren, Washtenaw, & Wayne Co.; City of Grand Haven & Village of Spring Lake (Ottawa Co.)	Disaster
5/13/80	Tornado	Kalamazoo & Van Buren Co.	Disaster
1980-89 TOTAL:		**13 EVENTS**	
		1977-79	
8/9/78	Sewer main break	Macomb Co.	Disaster
6/30/78	Thunderstorms, high winds, hail, rain	Berrien Co.	Disaster
6/28/78	Thunderstorms	Allegan Co.	Disaster
1/26/78	Blizzard, snowstorm	Statewide	Disaster
12/10/77	Snowstorm	City of Hamtramck (Wayne Co.)	Disaster
4/6/77	Tornado, high winds	Clinton, Eaton, Kalamazoo, & Livingston Co.	Disaster
1/28/77	Blizzard	Allegan, Barry, Berrien, Cass, Chippewa, Eaton, Hillsdale, Ionia, Muskegon, Newaygo, Oceana, Ottawa, Sanilac, Shiawassee, & Van Buren Co.	Disaster
1977-79 TOTAL:		**7 EVENTS**	

TOTALS FOR 1977-2001: 46 EVENTS (35 Disaster Declarations; 11 Emergency Declarations)

* under Act 390, P.A. 1976, as amended (The Michigan Emergency Management Act).
NOTE: Declarations made prior to the enactment of this Act were made under the authority of Act 302, P.A. 1945.
**A "State of Emergency" was also declared for this incident, under Act 302, P.A. 1945.